



Agricultural Research Partnerships (ARP) Network NOTES

Welcome to our first ARP Network Notes! Our goal is to keep you informed about ARP Network and Agricultural Research Service (ARS) current information. We hope that the notes build networking opportunities for businesses to connect with ARP Network Members.

We are seeking contributions for future ARP Network Notes from members who wish to share information that would be of interest to the group. Suggestions include events, Ag challenges and community initiatives. For ideas of content for future notes, please contact Cathy Cohn at

cathleen.cohn@ars.usda.gov.

Please help us spread the word by forwarding and sharing ARP Network Notes statewide with your company contacts, colleagues, other organizations, etc. Thank you!

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ARS

The Agricultural Research Service is USDA's primary internal research agency. ARS conducts research to develop and transfer solutions to major agricultural problems that are both national and international in scope. ARS has nearly 2,000 scientists nationwide and a few in overseas locations. ARS scientists carry out more than 800 research projects on a variety of subjects. ARS has a Congressional mandate to disseminate the research findings of these projects to the American public and other interested parties. Learn more by visiting: <http://www.ars.usda.gov>.

ARP Network

The ARP Network enlists the help of partners to spark economic development, entrepreneurship and community development. USDA Agricultural Research Service (ARS) founded the ARP Network in an effort to expand the impact of ARS research and provide resources to help companies grow. By combining ARS research expertise with complementary capabilities and talents of partnering organizations, the ARP Network helps stimulate economic growth through technological advancements. The ARP Network matches business needs with ARS innovations and research capabilities and provides business assistant services to help companies and startups solve agricultural problems, develop products and create new jobs. Learn more by visiting: <https://www.ars.usda.gov/business/Docs.htm?docid=24715>.

SBA SBIR Roadshow

The SBIR Road Tour is coming to a city near you! This is a national outreach effort to convey the non-dilutive technology funding opportunity provided through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Over the course of this year, individual program managers from the 11 participating agencies representing \$2.5 billion in early stage funding will embark on a 20 state road tour, participating in a series of events alongside technology entrepreneurs and innovation supporters from across the United States.

If you're an innovator, entrepreneur, researcher, or small technology firm, don't miss this opportunity. Every SBIR Road Tour stop provides an in-depth understanding of agency technology funding priorities, and one-on-one meetings with high level decision makers. Learn more by visiting www.sbirroadtour.com

ARS and SBIR

Now is the time to prepare proposals for USDA National Institute of Food and Agriculture (NIFA) Small Business Innovation Research Program (SBIR) program! Last year the USDA SBIR solicitation opened mid-June and closed early October.

USDA ARS and the USDA SBIR Program work together to encourage SBIR applicants to license ARS technologies and/or partner with ARS researchers and be considered for a SBIR grant. The relevant language in the SBIR's "Request for Application" states: "Additional factors that will be considered in the review process include whether an application involves a CRADA with a USDA laboratory, or a license to a USDA technology, or is a resubmission. In the event that two or more applications are of approximately equal merit, the existence of a CRADA with a USDA laboratory or a license to a USDA technology will be an important consideration. If one application is a resubmission, this will also be an important consideration." Learn more by visiting: <https://www.ars.usda.gov/Main/Docs.htm?docid=24821>

Partnership and/or Licensing Opportunity

Method for Detecting and Distinguishing Infectious Norovirus from Inactivated Norovirus

ARS has a technology that can distinguish between dead norovirus and viable norovirus. Hence if you have cleaned, for instance a cruise ship, and you want to know what kind of job the contractor did, this technology would be of assistance. Ready to use. Technology is available for licensing. U.S. patent no. 8,993,229. Publication available. ARS Docket no. 0053.11.

Please contact Jim Poulos: jim.poulos@ars.usda.gov.

Partnership Opportunity

Assessment Tool for Managing Nitrogen for Field Crops

Developing assessment tools for managing nitrogen (N) is an important but challenging task, due to the complexities of the soil-crop N cycle and the need to reduce N losses to the environment. The objectives of this study was to evaluate the effect of fertilizer N rates on post-harvest soil nitrate-N (NO₃-N), and to evaluate a delta-yield approach for classify post-harvest nitrate in fields, or management zones within fields. Forty N-response studies from MD were summarized that measured corn (*Zea mays* L.) grain yields from various fertilizer N rates. Results showed that post-harvest NO₃-N increased rapidly when yield responses to additional N were small.

This method for classifying residual-nitrate could be used in conjunction with yield monitors to identify areas likely to have high post-harvest residual-nitrate, which could be candidates for winter cover crops or areas needing evaluation of the previous year's N management plan.

ARS scientist is looking for an Ag IT company through a Cooperative Research and Development Agreement (CRADA) to assist with software development. ARS docket no. 0128.14.

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Partnership Opportunity

Allergens and Their Use in the Diagnostic and Therapeutic Treatment of Allergies

This invention relates to the concept that certain social insects or arthropods that cohabitate with humans (such as ants, termites, book mites, spiders and flies) may possess allergen genes, and their use in native and recombinant form as proteins for diagnostic and therapeutic purposes. The proteins encoded by these genes can be used in a variety of diagnostic allergen tests which are of a type that are currently marketable by major companies. These genes may also encode proteins that could be useful in the design and development of novel control measures as well as household detection methods. ARS is seeking a commercial partner through a Cooperative Research and Development Agreement (CRADA), who is willing to provide resources to work in conjunction with skilled Agency personnel at identifying new allergen genes useful for commercial use in treating or alleviating certain common household issues. ARS Docket no. 113.13.

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Partnership and/or Licensing Opportunity

Customizable Alarm System

ARS has created a technology that can be used as an alarm system to either provide an alert once a certain condition exists (like a predator approaching livestock) or to provide an alert once a certain condition no longer exists (like a child or an Alzheimer patient who is no longer within a distance from a caregiver).

One use of the system is to mitigate adverse interactions between predators and animals in agricultural production. Previous technologies intended for mitigating the effects of predators have generally been place-based, meaning the technology protects a place (e.g., pasture, corral, backyard, or building) from intrusion by predators and other threatening animals. The problem with a place-based threat mitigation system is that it requires the animals being protected to also be confined to a single, often quite small place. Obviously, this approach is quite ineffective and impractical for free-roaming animals (e.g., beef cattle on extensive rangeland). ARS scientists have designed a new mitigation system that dynamically responds to threatening situations wherever and whenever they occur. This invention provides a situation-based approach to threat and depredation mitigation which intelligently evaluates dynamic interactions between animals and responds where appropriate.

The system can also be programmed to give an alarm once any two nodes break contact. This could be highly useful in certain situations involving childcare and adult-dependent care, where close supervision is required.

ARS is in need of a commercial company to partner with in order through a Cooperative Research and Development Agreement (CRADA) to optimize the technology for its particular uses, as well as to manufacture and distribute the product. Technology is also available for licensing. U.S. patent application pending. ARS Docket no. 160.09.

Please contact David Nicholson: david.nicholson@ars.usda.gov

Partnership and/or Licensing Opportunity

Protein-Cyanoacrylate Nanoparticles that Improve Wetting Properties of Materials

Nanoparticles were generated using a mild chemical reaction and proteins derived from agricultural sources. These new materials change the wetting properties of hydrophobic surfaces by adsorbing to the surface. When transparent materials such as glass and transparent plastics are coated with the nanoparticles, the surface wetting characteristics are modified without affecting the transparency. This surface-modifying property can also be used for stainless steel, porcelain and polymer films made of non-transparent plastics, and could be used for improving visibility of windshields, mirrors and goggles.

ARS is looking for a commercial partner interested in commercializing this technology and/or evaluating the technology for potential commercial applications through a Cooperative Research and Development Agreement (CRADA). Technology is also available for licensing. Notice of Allowance for a patent has been issued from the USPTO. ARS Docket no. 131.11.

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Partnership Opportunity

Combinatorial Enzyme Technology

ARS has been developing various enzymes and associated technology for the conversion of agricultural waste fibers to designer oligosaccharides and other molecules with commercially viable food and non-food applications. Specialty oligosaccharides show particular promise because of their unique properties that

make them suitable for a variety of both industrial and personal uses. Starting materials for these oligosaccharides include biomass feedstock and agricultural waste fibers. There is a particular opportunity in exploiting the waste material generated from food and industrial processing, such as citrus peel, apple pomace, almond husk, sugar-beet pulp, rice husk, wheat straw, corn stover, oleaginous seed residues, algal processing waste, and many others.

The emerging "green" chemical industry -- with its increasing demand for new products that are environmentally friendly -- will particularly benefit from this technology for developing bio-based replacements for products normally derived from petroleum or synthetic chemicals. The Combinatorial Enzyme Technology is not limited to applications in the conversion of polysaccharides to novel oligosaccharides. This Technology should apply equally well to exploring new product functions in all types of biopolymers and heteropolymers.

The research strategy for this project applies combinatorial enzyme technology to convert agricultural waste fibers to designer oligosaccharides. It is anticipated that these oligosaccharides will either have their own commercial value or will be suitable for further processing into various commercial products. Moreover, optimizing the conversion process itself will likely result in a commercially-valuable technology. ARS is seeking a commercial partner through a Cooperative Research and Development Agreement (CRADA) who can help accelerate this project. ARS Docket no. 224.13.

Please contact David Nicholson: david.nicholson@ARS.USDA.gov

Partnership and/or Licensing Opportunity

Monoclonal Antibodies for Facile and Rapid Detection of Chemical Residues

Consumers are constantly faced with new information regarding the safety of their food. Environmental and chemical contaminants pose a potential health hazard, and off-label use of pharmaceuticals, feed additives, chemicals and pesticides can lead to food safety problems of worldwide concern. Producers, processors, government agencies and consumers with a vested interest in food safety have indicated a need for methods to detect chemical and biological targets in a rapid, inexpensive and user-friendly manner. With that in mind, researchers at the Animal Metabolism Agricultural Chemicals Research Unit, in Fargo ND, have developed monoclonal antibodies for the detection of food residues. Target compounds currently available or under development include feed additives (ractopamine, zilpaterol, Roxarsone), insecticides (thiamethoxam, imidocloprid), environmental contaminants (triclosan), drugs and antibiotics (NSAIDs, apramycin, tulthromycin) and flame retardants (PBDEs). Benefits include: attractive alternative to traditional instrumentation methods; sensitive, specific, and capable of high throughput; residues from many origins may be measured - meat, feed, milk, retina, urine etc; no tedious sample extraction and cleanup procedures; and cost-effective monitoring tool.

ARS is seeking a commercial partner to further develop these monoclonal antibodies into test kits through a Cooperative Research and Development Agreement (CRADA). The technology is also available for licensing. U.S. Patent 6,274,334. ARS Docket No. 0075.00.

Please contact Bryan Kaphammer: bryan.kaphammer@ars.usda.gov

Partnership and/or Licensing Opportunity

Seed Treatment to Enhance Yield under Water Limiting Conditions

ARS scientists at the Cropping Systems Research Laboratory in Lubbock, Texas have developed a seed-seedling treatment that enhances yields 5 to 20% under water limiting conditions. Yield enhancements in cotton have been obtained annually in three years of field trials. Preliminary results have also shown a 10%

yield increase in chili peppers using this yield enhancement technology. This technology may have broad application to many crops grown under water limiting conditions.

ARS is seeking a commercial partner to further this research through a Cooperative Research and Development Agreement (CRADA). The ideal partner would be able to contribute both intellectually and financially to the development of this technology. The technology is also available for licensing. U.S. Patent No. 7,634,870. ARS Docket No. 0061.05.

Please contact Bryan Kaphammer: bryan.kaphammer@ars.usda.gov

Partnership Opportunity

New Technology for Measuring Respiration Rates in Living Organisms

ARS scientists at the Insect Genetics and Biochemistry Research Unit in Fargo, ND have developed a novel apparatus to measure the respiration rates of insects and other organisms that consume oxygen and release carbon dioxide. This system is simple to use, requires minimal maintenance, and can be operated at any humidity level unlike fuel cell systems that require 0% humidity, which can result in stress to the organism and alter the results. Additionally, the system costs approximately \$30 per unit to build, significantly less than current state-of-the-art fuel cell based respirometers that cost over \$30,000.

ARS is currently looking for a commercial partner through a Cooperative Research and Development Agreement (CRADA) to help develop this system for commercial use. The ideal partner would have scientific instrument manufacturing expertise. ARS Docket No 0069.13.

Please contact Bryan Kaphammer: bryan.kaphammer@ars.usda.gov

New Available Technologies for Licensing

Each year, approximately 60 new patents are issued by the U.S. Patent Office for USDA inventions. The Office of Technology Transfer (OTT) transfers these inventions through licenses to the private sector for commercialization. View *recently filed* U.S. patent applications that are available for licensing:

<http://www.ars.usda.gov/business/Docs.htm?docid=25285>

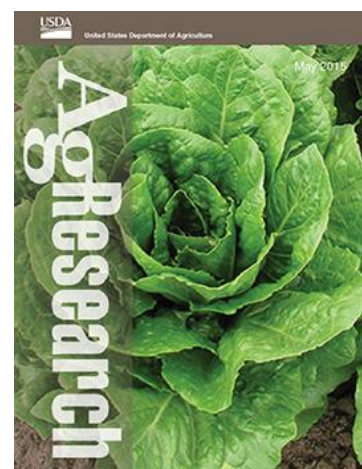
Recently Issued ARS Patents

View patents issued: <http://www.ars.usda.gov/business/Docs.htm?docid=25285>

ARS New Digital Online Research Magazine

AgResearch (formerly called *Agricultural Research*) is now a monthly publication that will highlight short features on the scientific research discoveries occurring at all of ARS' research laboratories across the Nation and abroad. View *AgResearch* at <http://agresearchmag.ars.usda.gov>

The new magazine replaces the previous print edition of the agency's *Agricultural Research* magazine, which debuted in early 1953 and published its last print edition in 2013. Back then, the bimonthly publication focused on agricultural research stories that addressed the growing food, fiber, and agricultural needs of post-World War II America. Today, we still have that same commitment to bring our readers stories about research discoveries



that have an impact on their everyday lives.

New Issue of Healthy Animals Online

Healthy Animals, an online is a compilation of animal health-related research news put out twice a year by the Information Staff of the Agricultural Research Service. ARS is the chief scientific agency of the U.S. Department of Agriculture.

View the latest Issue at: <http://www.ars.usda.gov/is/np/ha/han56.htm>

Get more information: www.ars.usda.gov



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